

## VERTIGO AND STAGGERING IN TEMPORAL LOBE LESIONS.

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### REPORT OF TWO CASES OF FOCAL LESION OF THE RIGHT TEMPORAL LOBE.

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Lesions of the temporal lobes often give rise to no localizing symptoms. In some cases, however, there are observed partial deafness of the opposite ear and disturbances of taste and smell.

When the lesion is on the left side and involves the posterior part of the first and part of the second temporal convolutions, word-deafness occurs. Hysterical symptoms have been noted in connection with tumors of the temporal lobes (Bramwell).

I have had under observation two cases of focal lesion of the right temporal lobe. In one case the lesion was well localized, chronic, and not especially irritative. Hence it furnishes an excellent pathological experiment in the study of localization.

The other case is much less valuable, but it is reported briefly for the reason that a similar type of symptoms was observed to that shown by the first patient.

In the first case there was a distinct hysterical condition present, and a peculiar class of forced movements. The patient had a frequent tendency to fall over to the right, and sometimes to whirl around to the right.

In the second case the patient also frequently fell over towards the right.

I have come across a third case, in which frequent staggering to the right side was a prominent symptom.

It has seemed to me, therefore, that possibly a close analysis of cases of lesions of this lobe might reveal this symptom often, and that it might have some diagnostic value. And this view might be justified physiologically by supposing that the vestibular branch of the auditory nerve, which has to do with our space sense, has a representation in the temporal lobe, as well as its companion, the cochlear root.

Physiologists have found that rolling and forced movements can be produced on animals by injuries of:

1. Cerebral cortex, especially in the parietal lobule.
2. Corpora striata.
3. Optic thalami.
4. Cerebral peduncles.
5. Pons Varolii.
6. Tubercular quadrigemina.
7. Cerebellar peduncles, especially middle.
8. Olivary bodies.

The principle places, however, are the olivary bodies, middle cerebellar peduncles, posterior tubercles of the corpora quadrigemina, and cerebral peduncles.

Extirpation of the temporal, parietal, or in fact any of the cerebral lobes in lower animals, has not systematically caused forced movements. This, however, does not prove that the cerebral cortex of man does not contain a representation of the sense of equilibrium or relations in space, but only that the function of equilibration may be carried on by other and lower centres.

Clinicians have observed forced movements in cases of lesion of the middle cerebellar peduncles and parietal lobes.

The only observations, so far as I know, bearing upon forced movements due to lesions of the cerebral hemispheres, are those collected by Nothnagel and Bechterew (*Arch. f. path. Anat. u. Physiol.*, 100 Bd. 3 H.). These consist of the cases of Romberg, Friedreich, Petrina, Mesnet, Longet, Romberg, Penzoldt, and Bechterew. Almost all of them are old cases, and will not stand close analysis. Bechterew, however, thinks that there is sufficient evidence

to justify the hypothesis that the anterior cerebellar peduncles are connected with the upper parietal lobe.

In my opinion, although there is evidence enough that this lobe has to do with the muscular sense, our space sensations are not disturbed by its irritation or destruction. The stumbling and awkwardness of ataxia may occur without vertigo or sense of confusion in our relations in space.

The fact which Schaefer has shown, that irritation of the tempero-sphenoidal lobe causes conjugate deviation of the head and eyes, and the fact that a large proportion of deaf-mutes cannot be made vertiginous, may be mentioned in this connection.

Besides this, Flechsig has described, and pathological cases reported by Bechterew, Flesch and Koneff, and Ros-solymo show, a tract of efferent fibres extending from the tempero-occipital lobes down through the outer part of the cerebral peduncles to the pons nuclei, thence connecting by the middle cerebellar peduncles with the cerebellum of the opposite side. Thus these lobes are placed by a band of efferent fibres in connection with the cerebellum.

CASE I. *Summary*.—Female, age 32. Blow on the head; eighteen months later, chill, fever, for three days, temporary rigidity of left arm, continuous occipito-frontal headaches, and vomiting; four months later, vertigo, forced movements, falling suddenly, always back and to right; short period of stupor and vomiting. Recovery, but constant attacks of falling toward right and backward, and of falling out of bed to right. Sudden fall and death. Duration of symptoms, two years.

Autopsy: focal encephalitis size of pigeon's egg in middle two-fourths of third and fourth temporal convolutions on right side. Recent hæmorrhage, bursting into lateral ventricle.

*Detail*.—Kate C., age thirty-two; mar.; Ireland; domestic, admitted to hospital September 29, 1888.

*Family History*.—Father died of dropsy, otherwise negative.

*Previous History*.—Always healthy. Has had rubeola and rheumatism for the past two winters. Denies

syphilitic taint; drinks moderately; menstruated first at fourteen years, always regular. No children; had a criminal abortion performed on a four-month fœtus six years ago. Two years ago patient fell down an air-shaft, a distance of thirty-five feet, striking on her back and the back of her head. She was unconscious for several days; was in bed for several weeks. Her friends say she has always been different since, both in disposition, and has been "queer" in her mind. She has been at times ugly and destructive. Patient denies any epileptic history or any symptoms of epilepsy.

*Present History.*—Since her fall, was perfectly well until six months before admission, when she was taken with a chill, followed by fever, nausea, vomiting and anorexia, and was sick in bed for three days. Her left arm became stiff and she was unable to use it. This lasted only for a few hours. Since then patient says she has had frontal and sometime occipital headache almost continually, usually accompanied with nausea and often with vomiting. Three weeks ago patient suddenly became weak and dizzy and was unable to walk without falling. She was taken to the Harlem Hospital and remained there a week, during which time she was in a stupor. After recovery she was discharged. On the day of admission, while coming to hospital, patient became dizzy and fell as she was getting from the horse-car and struck her head, at the same time she had a severe chill and vomited considerably.

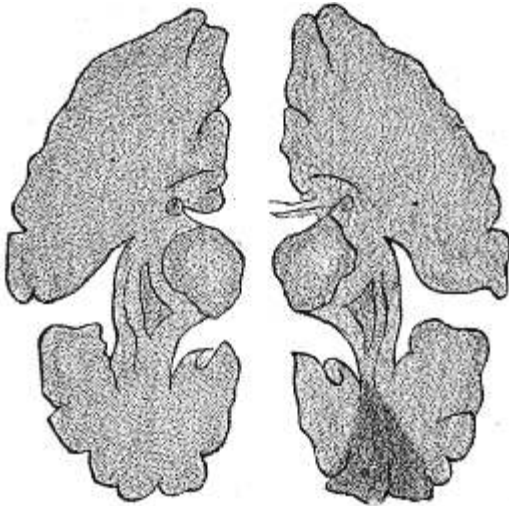
*Physical Examination.*—Patient is well nourished, not anæmic, tongue moist and slightly coated. Pulse, lungs, heart and liver are normal. Patient lies unconscious and will not rouse up. Occasionally, without apparent warning, she vomits spinach green matter in great gushes, ejecting it almost on the patient in the next bed. Over the right eye is a birth-mark, looking exactly as if patient had a black eye. Pulse, temperature and respiration were always normal. After being unconscious for two days, patient became semi-conscious, and complained of severe headache, which improved greatly under iodides, but finally this did not stop it, and an order was given for menthol., gr.

x, and antipyrin, gr. x, which never failed to stop it for the time being. This headache returned again and again, but was always relieved temporarily. Patient, as she grew more conscious, would be very restless, and fell out of bed continually always on the *right* side of the bed; finally she was tied in. After a few days she was up and about, even helping. She always walks with a stiff heavy tread and with her body bent backward and towards the right side, the body bent from the waist upward and appearing to balance and carry most of the weight on the right hip. Her speech was slow, deep-toned and very deliberate. She also would blurt out odd and amusing remarks. Occasionally, while carrying a pail of water or a dish, she would become dizzy and lose the power of holding what she was carrying, and once dropped hot water on her feet and scalded them quite severely. For the following three weeks after examination she had several attacks of unconsciousness lasting for two to three days each, during which she would vomit the same spinach green matter, and as she came out would always complain bitterly of the intense headache. About a week before she died she became subject to very severe attacks of dizziness, and would fall over backward *towards the right always*. These would come on suddenly and without warning, and patient would be standing upright and then would fall over on her head with such force as to cause her feet and legs to fly over beyond her head. Sometimes she would be found with her arm bent around an iron pillar in the centre of the ward, and swinging her body around it with great rapidity. Two days before she died, she continually threw herself out of the right side of the bed, and when sitting in a chair she would throw herself flat on her face. Finally, she started to walk across the ward and fell backward, striking her head with great violence. The nurse helped her into a chair in less than a minute. She stiffened herself out, and calling the nurse by name, she breathed a few times and died.

*Autopsy* showed every abdominal organ healthy; there were a few adhesions on the upper part of the right lobe of

the liver and at the base of the right lung ; otherwise lungs and heart were normal.

On removal of the brain, a good deal of blood was seen in the right middle fossa. On the under surface of the right temporal lobe was a focal lesion consisting of softened brain-tissue mixed with blood. The lesion involved the third and fourth temporal convolutions in their middle three-fourths, and communicated by a fresh opening made by the recent hæmorrhage into the right lateral ventricle. On carefully washing out the cavity, it was seen to be distinctly limited, as though the process of softening had been



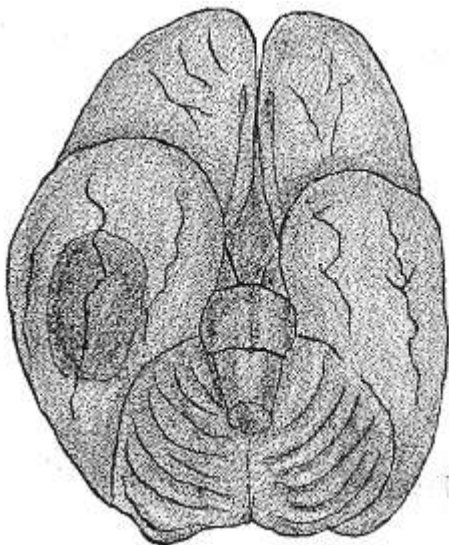
CASE I.—Abscess of Right Temporo-Sphenoidal Lobe.  
Hæmorrhage.

an old one. Microscopical sections of the limiting wall showed a decided inflammatory change, there being a thin pyogenic membrane evidently in process of forming. The point of lesion lay directly over the upper surface of the petrous bone, and at this point meninges were thickened and adherent; but there was no communication with the ear, and on opening the mastoid cells and labyrinth no signs of inflammatory change were found.

The location and limits of the lesion are shown here.

The hippocampal gyrus was not involved.

The blood-vessels seen on microscopic section showed some thickening of the walls. Death was caused finally by a rupture of large vessel, which caused a hæmorrhage of sufficient magnitude to burst into the lateral ventricle. The lesion was, therefore, a focal encephalitis, having a slow course, and ended by a rupturing of a blood-vessel, which rupture might very well have been the result rather than the cause of her sudden fall.



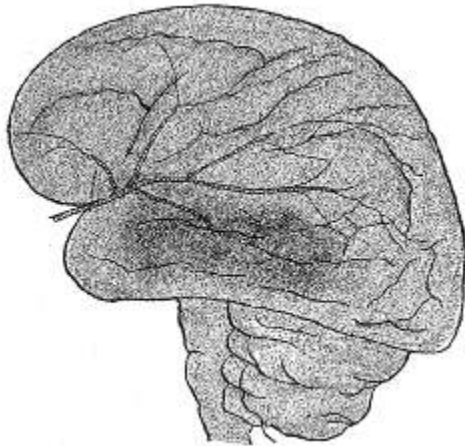
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An examination of the cerebral peduncles does not show a degenerated tract to the naked eye.

CASE II.—J. B. W., age 40. Patient was brought to the hospital delirious, and was put into the cell; he acknowledged drinking, and acted like a man in the active stage of delirium tremens. He gradually became unconscious in about twenty-four hours and died. His friends said he had had, a year ago, an attack of apoplexy; since then he has had several attacks of dizziness, and would fall forward, striking on the right side of his head; also he had had attacks of "twitchings." These appear to have been very severe and general; he would always fall in them,

and always injured the right side of his face, sometimes causing it to bleed. His memory previous to his apoplectic attack had begun to fail, and patient would have to be told facts several times before he would take them in.

Autopsy showed lungs in both lower lobes to be in state of red hepatization from pneumonia. Liver large and slightly cirrhotic. Heart normal. Kidneys, capsules adherent, cortex slightly increased, and markings a little indistinct. Brain: there was a great deal of serous effusion over the convexity, and there also appeared to be some beginning meningitis along the course of the vessels.



CASE II.—Chronic Meningo-Encephalitis. Right Temporal Lobe.

There was local pachymeningitis over the middle of the right second temporal convolution. On tearing away the membrane, a deep laceration of the brain at this point was made, and beneath it was seen a focus of softening involving the middle fourth of the second temporal superficially, extending deeply back and involving the second and third temporal as far as the occipital lobe, but not involving the ventricles. There was some recent meningo-encephalitic softening, also extending forwards and involving slightly the point of division of fissure of Sylvius and island of Reil. The middle cerebral artery was not occluded,



but evidently one of its branches had become recently involved. The arteries were not atheromatous. Only one vertebrate artery could be discovered.

A case of abscess of the right temporo-sphenoidal lobe, with staggering to the right as a symptom, is briefly reported in the Providence Medical Journal, Jan., 1888.

In looking over the histories of the various lesions of the temporal lobes, I have not found any case, aside from the one just cited, which resembles those here reported, though several are recorded in which there were disturbance of motility.

The interpretation that I have put upon the symptoms is therefore justly open to criticism. I can only give the facts for what they are worth; and suggest that in the majority of cases the disease has been acute, in others a special examination of the vertigo and motor disturbance was not made.

It may be that the right temporal lobe is more especially related to the space-sense, just as the left lobe is more related to the sense of hearing.

I can affirm very positively that in this case there was no disease of the ear.

Finally, I would call attention to the well-known fact that the cortical representation of sensory organs is widely distributed. Destruction of one part is easily compensated for by other regions. One might easily expect that a central cerebral lesion irritating fibres from the vestibular nerve would usually cause only slight symptoms. It remains to be seen, therefore, whether *in future studies of lesions of the temporal lobes will not show that vertigo and staggering are not unusually frequent.*

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